We claim:

1. A process of co-extrusion of a thin electrode sheet with a thin electrolyte polymer sheet directly onto a current collector sheet for a lithium polymer battery, said process comprising the steps of:
   (a) mixing a polymer with electrochemically active material, lithium salt and electronic conductive material in a first mixing chamber to form an electrode slurry;
   (b) mixing a polymer with a lithium salt in a second mixing chamber to form an electrolyte slurry;
   (c)feeding said electrode slurry through a first flow channel and said electrolyte slurry through a second flow channel;
   (d)extruding said electrode slurry in the form of a thin electrode sheet through a first die opening connected to said first flow channel directly onto a moving current collector sheet; and
   (e)concurrently extruding said electrolyte slurry in the form of a thin electrolyte sheet through a second die opening adjacent to said first die opening and connected to said second flow channel, said thin electrolyte sheet being extruded directly onto said thin electrode sheet.

2. A process of co-extrusion as defined in claim 1 wherein said thin electrode sheet and said thin electrolyte sheet are extruded on one side of said current collector sheet.

3. A process of co-extrusion as defined in claim 1 wherein thin electrode sheets are extruded on both sides of said current collector and a thin electrolyte sheet is extruded onto each said thin electrode sheets of both sides of said current collector to form a bi-face assembly.

4. A process of co-extrusion as defined in claim 2 wherein said thin electrode sheet and said thin electrolyte sheet are extruded through a slot die having a pair of flow channels and a pair of slot openings.

5. A process of co-extrusion as defined in claim 3 wherein a pair of said thin electrode sheets and a pair of said thin electrolyte sheets are extruded through a multiple slot die having four flow channels and four slot openings.

6. A process of co-extrusion as defined in claim 5 wherein said multiple slot die comprises a central channel adapted to guide said current collector between said four slot openings such that a thin electrode sheet and a thin electrolyte sheet are extruded on both sides of said current collector.

7. A process of co-extrusion as defined in claim 1 wherein two layers of cathode material are extruded on each side of said current collector through a first slot die having a pair of flow channels and two layers of electrolyte material are extruded directly onto said two layers of cathode material through a second die having a pair of flow channels.

8. A process of co-extrusion as defined in claim 7 wherein said first slot die comprises a central channel adapted to guide said current collector between said pair of flow channels such that a thin electrode sheet is extruded on both sides of said current collector.

9. A process of co-extrusion as defined in claim 8 wherein said second slot die comprises a central channel adapted to guide said current collector with said two layers of cathode material between said pair of flow channels such that a thin electrolyte sheet is extruded onto each said layers of cathode material on both sides of said current collector.

10. A process of co-extrusion as defined in claim 3 wherein said thin electrode sheets and said thin electrolyte sheets are extruded through a pair of slot dies located on both sides of said current collector, each of said pair of slot dies having two flow channels and two die openings respectively for extruding said thin electrode sheet directly onto said current collector and

for extruding said thin electrolyte sheet directly onto said thin electrode sheet.

11. A process of co-extrusion as defined in claim 3 wherein said thin electrode sheets are extruded through a first pair of slot dies located on each side of said current collector and said thin electrolyte sheets are extruded through a second pair of slot dies located on each side of said current collector.

12. A process of co-extrusion as defined in claim 1 further comprising means for adjusting the thickness of said thin electrode sheet and the thickness of said thin electrolyte sheet.

13. A process of co-extrusion as defined in claim 12 further comprising means for measuring said thickness of said thin electrode sheet and said thickness of said thin electrolyte sheet.

14. A process of co-extrusion as defined in claim 13 wherein said means for measuring is a measuring device selected from the group consisting of mechanical device, optical device, ultra-sonic device, Gamma gauge and Beta gauge.

15. A process of co-extrusion as defined in claim 13 further comprising an electronic control unit linked to said means for measuring said thickness and to said means for adjusting the thickness; said electronic control unit receiving measurement data from said means for measuring said thickness, comparing said received measurement data to pre-set thickness tolerances stored into memory and, when thickness measurement fall outside the pre-set tolerances, sending signals to said means for adjusting the thickness to effect adjustment of the extruded layers.

16. An apparatus for co-extruding components of an electrochemical cell of a lithium polymer battery onto a current collector sheet, said apparatus comprising a plurality of passageways linking a plurality of extruder to at

least one die; said at least one die having at least two flow channels connected to at least two die openings, said at least one die adapted to extrude at least one cathode sheet onto a current collector substrate and at least one polymer electrolyte sheet onto said at least one cathode sheet.